Notebook Series -- Notebooks by Experimenters Other Than Edison
Miner's Safety Lamp Experiments
Notebook, N-14-07-09

This notebook was used by Leroy E. Briggs during July-September 1914 for experiments on miner's safety lamps. The first entry includes a list of things to do and questions to ask in pursuing improvements to the lamp. The following entries consist of daily logs of Briggs' activities and experimental work, including battery tests for locomotive headlights. Some of the notes mention suggestions made by Edison, such as trying different methods of using safety springs on a lamp or using different brass bulbs. Other entries include detailed information on Briggs's conferences with Edison regarding these experiments. The front cover is labeled "Thomas A Edison Lab. Book No. 4 Mine Lamps L. E. Briggs." The pages are unnumbered. Approximately 75 pages have been used.

July 9, 14.

1. Ask about Clarks latest model of Miners Rescue Lamp.

2. What attention were the Miners cells given since they were received at the Bureau? Not shipped June 29, 14.

3. What follows the tests of safety devices?
My safety tests report of Dec. 5, 13.

4. How soon may we know that the lamps I test will receive official approval?

5. How were the bulbs selected?

6. May I have duplicate set sheets.

Mr. Hood, Chief Mechanical Engineer.

July 10, 14

9:15 Arrival at Experimental Station.
9:00 Mr. ~~Oldacre~~ Allerley & Mr. Crocker

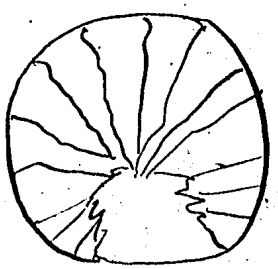
#1. 3 attempts were made to break bulb. — in each case bulb was knocked out of position without breaking bulb. At the third trial, the jar broke the filement but not the glass bulb. bulb # 204.

A ~~test~~ trial was made by setting bulb at tip Position 14 to see if possible to break bulb. Not considered as official part of ~~test~~. Tip snapped off — bulb intact — not tested in gas this time.

Battery charged yesterday

10:17 decided to make tests starting with no 14

Note 2: Preliminary ~~test~~ just previous proved gas was present. In preparing each test, testing



star break.

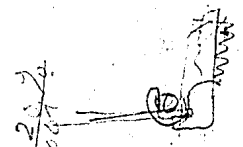
tool point was ~~adjusted~~ against tip end of bulb.

Note #3 (2) Two blows required — first blow shattered reflector glass — point of tool in position reached after first blow — second blow broke bulb. as noted on ~~last~~ 2nd results. Gas present as proven by explosion caused by jump spark.

Note #4 ~~gas test~~ blown out after

Note #5 #3 Lamp bulb driven back — tip point following down safety spring — wedging bulb in reflector at an angle. Contact was disconnected — but fine point of bulb tip was broken but safety spring operated thereby preventing ignition of gas. Lamp restored to normal position and current of air

C53



caused filament to burn up.

Note 6. Gas tested. ~~did not~~ explode at ~~first~~ jump spark but did on second trial.

Tool point is a ~~round~~ piece of self hardening steel set into a square cross section piece of machine steel. End of self hardening steel was sharpened to a very fine point.

12.00 Note: first blow only displaced bulb H did not go back far enough to open circuit. Not counted as test. Bulb returned to ~~test~~ position and record blow administered.

#4

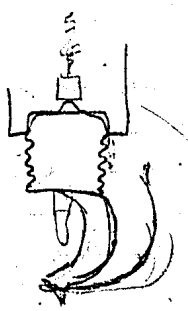
Note 7 results reported were obtained on 3rd trial. 1st trial the bulb was ejected without being broken. Before second trial the breaking tool point was sharpened to a decided point. Second trial also resulted in no test. Gas tested OK previous to second trial.

#5

Note 8. Bulb remained in normal position. Front & sides of glass bulb broken away — enough of tip and back of shell left to maintain contact. Filament glowed for about one minute. Undoubtedly no gas inside reflector — no explosion. To be photographed

Clark complained that same weak plunger springs were used. He thinks this bulb would have been ejected if stiffer spring

#8



had been used. glass cracked
very uniformly & almost
equal pieces.

#9 #6 Tool point pierced the screw shell thereby breaking one leading wire Point struck the screw shell squarely passing through more than half of the diameter. Filament however was intact.

#10 #8 Camp 26 Bulb 210 First trial 2:25 was no test. Results of this trial calls attention to fact that socket of different headpiece were recessed to different depths - also ends of lamp bulb bases were much more pointed than others.

The socket ~~was that in~~ the first tests which allowed the bulbs to be unseated before glass could break, was found to

CU

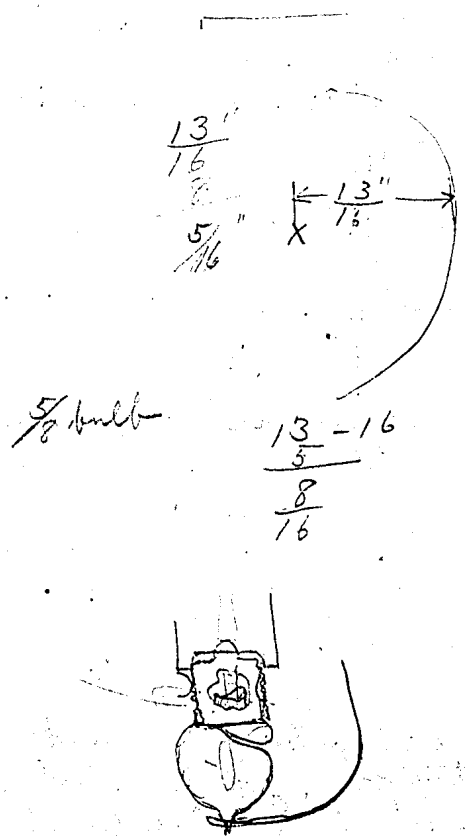
be recessed to a relatively shallow depth. i.e. reflector #28

Reflector #26 was deeply recessed.
Reflector #18 was to be examined after it was photographed to re recess.

Unless bezels are waxed or "sealed", they work off the reflectors.

Approval may be qualified that plunger spring and safety spring be made stiffer.

10 as reported as result of 3 trials. Bulb used in first trial was punctured therefore not used in last two tests. Final test punctured the bulb base at the bottom, loosened upon sealing wax thereby breaking leadingin wires.



Remaining portion of bulb still retained in normal position in reflector.

#11 #9 Tip and base of bulb remained in their normal position but bulb cracked open at junction of bulb with screw shell. Glass tube holder of leading in wires was opened up. Rupture allowed considerable ~~on~~ passage of ~~opening~~ into bulb. See photo. Filament burnt off in bulb.

#12 #10 Bulb base pushed out of its socket by testing tool. 5th trial.

Clarke #17 #7 One trial no test

The results of trial called attention to fact that the sockets of various headpieces are recessed to different depths also ends of bulb bases are much more pointed

C15

in some instances than in others.

#13-11 bulb thrown out of socket thereby breaking circuit.

#14-12 Both bulb broken and end of case torn off difficult to tell which acted.

#15-13 Bulb thrown out of socket.

#16-14 Bulb thrown out of socket. tip broken out.

Big order just going to South Africa.
Trial inspection sheet with weights on file in Clarks office.
Confidentially how to bring force to bear upon Bureau to hasten approval of lamp.
Letter to Clark in two weeks inquire about progress.
✓ Burrows told Clark that he had investigated the mines lamps from the business point and he knows what

Clarke says life tests of standard American bulbs on market
Lead cells 2.1 down to 1.95 volts.
Av. of 40 lamps 870 hrs.
7 lamps burnt 1600 hrs.
and C.P was still above bureaus requirements when ~~test~~ ended.
Only 2 lamps ran less than 300.

it would pay them to develope the lamp to the highest state of the art and that they were willing to spend money for this development.

Appeal cannot be granted until all tests are complete - Clarke can not tell diffinitely at present when this will be but he thinks not before 6 weeks - However — two weeks of testing he can tell more — I shall write to him and then he will intimate how progress is. All mechanical details will then be completely thrashed out. - See Monahan about his model with latest suggestions. stiffer plunger spring & safety spring.

July 11,

#1 Headpiece hit elbow producing a flat spot about 5/16" x 1/2"

#2 Hit on edge of bezel & corner of elbow
Bezel edge of reflector slightly deformed
Headpiece hit on edge

#3 Hit edge of bezel
Slight deformation of turned back edge of reflector.
Plug shield broken from armor at Battery end of cable.

4 Hit on side of cable elbow making mere scratch.

#5 Reflector came apart before struct on lower edge of bezel making slight scratch on bezel.

#6 See note no 5.
After headpiece strikes on lower edge it turns on a side & strikes one of the bayonet pins and in those which it has driven inward making the removal of the bezel somewhat difficult.
Slight deformation is noticed on the inner surface immediately beneath the bayonet pin.
Deformation of the edge of reflector made it difficult to assemble the bezel & reflector

Note cable plug shield was not removed — tests.

#7 Hit top side of cable angle bracket making a flat place 1/4" x 1/2".

Now change in reflector.

#8 ~~Struck~~ on edge of bezel & deformed it & edge of reflector so that removal of bezel was very difficult.

(Note that if round groove on edge of bezel were larger it would protect bayonnett pins.

#9 Previously unmounted bayonnet pin struck, grinding it in radically, but not deforming the reflector.

#10 Headpiece struck on bottom edge of bezel which was not ~~not~~ originally round but turned back edge of reflector was flattened.

down.

#11 Reflector hit on side of bezel - dressed out bayonet pins on making it hard to remove bezel.
Almost impossible to put bezel back on again.
Necessary to bend bezel with pliers to get on. Reflector also hit to assist assembly. Bezel cannot be completely closed.

#12 Struck on previously injured mount of cable elbow making flat spot increased to 5/8" x 3/8".

#13 Struck on lower side of bezel. Typ. dent onto already injured bayonet pin making it almost impossible to remove bezel.

#~~13~~ Bezel could not be replaced without bending reflector back into shape.

#14 Struck on screw shell of cord lock ~~so~~ thus breaking the force of blow on reflector. Owing to difficulty of removing bezel ~~so~~ to get ~~that~~ glass in nearly cracked across one ~~of that #9~~ same glass as used for #9's

Recess in Pocket in the headpiece #4 was especially deep and safety sprung unusually stiff and thus may account for the few cases of circuit being interrupted by safety device.

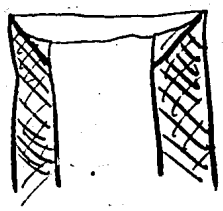
#15. Headpiece struck on side of bezel. Bezel so bent it could not be removed without permanently deforming it & the reflector.

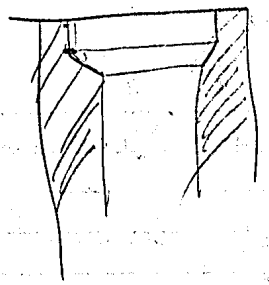
Monahan made the reflectors .040 same as bezel. Recommendation.

Bobbing Dropping test

#16 Bobbing struck on lower right hand (under hook) Seam extension was bent up against body of case.
Headpiece glass is broken.

#17 Reflector glass cracked across.





#18 Hit lower right hand corner. no offensive marks. Reflector glass cracked ~~no~~

#19 Lamp Safety device worked bulb blown out of circuit but still held by safety spring.
Bayonet pins bent through

Monahan try bump for locking bayonet to bezel.

#20 Lamp pulled entirely out of socket.

Monahan - stiffer safety spring & stronger plunger spring & not too deep a recess in socket.

#21 Slight bending of cage at locket staple.

Outer glass cracked before ~~test~~ all further cracked by this ~~test~~.

#22. lamp bounded from bench from which ~~test~~ lamp made and fell 34" farther to concrete floor.

Lamp glazed out of cement but not out of spring.

No wire glass.

Frequent action of ~~safety~~ device ~~of this test~~ noted as compared with the ~~more severe tests~~ previous tests leads us to conclude ~~that~~ the ~~recent~~ tension of the locket & tension of safety spring is about average.

#23 No outer gloss coat in this boat

Only change of battery condition was bending of screen up against bottom of battery.

of the seam bent in by previous tests.

July 27, 14

Received today by Parcel Post
one package:

ten - 2.6 volt, 0.4 amp, G-6
clear bulb Miniature Base
Mazda Lamps
from National Lamp Works of
General Electric Co.
From
Elisa Miniature Lamp Division
324 Lafayette Street
New York City.

C 390

July 27, 14

Independent Lamp & Wire Co.
1733 Broadway NYC
R.S. Carrick

#1	#3	#5	#7
0.72	.88	.675	.60
.80	.872	.680	.598
.78	.850	.666	.617
.79	.845	.672	3 | 1.815
4 | 3.09	4 | 3.447	4 | 2.693	.605
.77	.862	.673	
.192 cp.	.216 cp.	.168	.151

#9
.716
.710
.717
.715
4 \| 2.858
1.714
.178 cp.

July 27, 14

Elmo Miniature

13 1/4" from lamp — 13 1/4² = 1.22 ft.²
Shunn std scale, constant .205

#2	#4	#6	#8
2.80	1.98	2.90	2.13
2.82	2.02	2.85	2.14
2.68	2.00	2.83	2.16
2.68	2.00	2.83	2.16
4 | 10.98	4 | 8.00	4 | 11.41	4 | 8.59
2.745	2.00	2.85	2.148
.686 cp.	.500 cp.	.713 cp.	.537 cp

#10
1.94
1.93
1.92
2.00
4 \| 7.79
1.95
.488 cp.

C.40

July 29, 17

Figure Candle Powers of bulbs.
✓ Skeleton bulbs with data sheets to Monahan.
✓ See how Austrian lamp tests are going.

Research dept — complete plots of runs.

Lamp tests in Gas.

✓ Get spark coil and batteries
✓ ½ cu ft gas per charge
✓ Write Clark — Springs received OK? Progress of test? Charging Panel??
Write Report

↖ Tested C.P of several lots of these lamps.
Tests of headlight 48 V cells.
Gas tests.

July 29, 14.

Inspection of ten lamps.

Note 1 #19 Cracked lead in cap hook.
filament 3/64" more than 13/16
taper - deep
side wall 1/32
Spring stiff temper OK.
Plunger spring fair
OK

Note 2 #12 filament little less than 13"/16
taper deep.
side wall 1/32
Spring stiff. temper good
Plunger spring fair
OK

Note 3 #29 filament OK 13"/16
taper deep
side wall little over 1/32
Spring stiff temper good
Plunger spring fair
OK

July 29, 14

Note 4 # 5 filament 1/32 less 3/16"
taper - deep
side wall - 1/32 +
Spring stiff. temper fair.
Plunger spring rather weak
OK

Note 5 # 45 Austrian bulb
filament 1/32 less 13/16
taper deep steep
sidewall 1/32
Spring very stiff. temper good
plunger spring fair
OK

Note 6 #7 filament 1/16" more 13/16
taper steep
side wall 1/32
spring not very stiff - temper soft
heat spring filament 13/16
spring too soft.
plunger good
See Monahan

July 29, 1[illegible]

Note 7 #10 filament 1/16 more than 13/16"
taper steep
sidewall 1/32 +
spring stiff temper good
plunger stiff OK
vent spring OK
OK
top of G.E. Bulb over 1/4" long

Note 8 #9 Metallic tubing broken
from Plug shield, Connection
poor. Circuit interrupted.
filament 1/32 more 13/16"
taper steep
sidewall 1/32
spring very soft.
plunger spring OK.
X See Monahan

Note 9 #48 filament 13/16"
taper two different tapers OK
sidewall 1/32
spring very soft
plunger four (catcher?)

Bulb broken in position by hammer.
filament left intact
bulb ejected -

Note 10 # 21 11/64 less 13/16"
taper stud
sidewall 1/32
spring pair
plunger spring strong.

lamps broken with hammer (in position)
filament intact – ejected.

July 30th.

Headlight for Locomotives.

Battery tests (Reported July 22th) giving Comparison of Discharges of Edison and Exide.

Discharge through specially designed rheostat.

Voltage regulation at lamps between

5.35 V 97.3% normal voltage
170% normal life
92% normal candle power

5.60 V 102% normal voltage.
78% normal life
108% normal candlepower

Average 99.7% normal voltage
120% normal life
surely normal
100% normal candlepower.

July 30.

Change periods for adjustment of rheostat:

		# 1	5 coils
1/2	1/2 hour	Control # 2	4 coils
2	2 1/2 hour	# 3	3 coils
3	5 1/2 hour	# 4	2 coils
5	10 1/2 hour	# 5	1 coil
5	15 1/2 hour	# 6	no coils
4	19 hrs	# 6	down to 5,35 across lamp.

Variation in lamps: different lamp used during each run.
Average of 2 lamps 18 amperes.

$450,

Questions to Mr Sommers.

5½ volt	6 volt
normal life	normal life
Candlepower	Candlepower
Watts	Watts
Amperes	Amperes
Watt ep.	Watt ep.
Cost	Cost
List, net?	List, Net?

How soon can I receive fifty lamps after ordering?

Will they be made up special or are they kept in stock.

When did you change the construction?
Last 5 months.

Is this latest lamp in use now on the Locomotive?

July 20, 14.

Mr. Hutchison, how many finished models shall I have made.

Jewy's rectifier: - voltmeter cost ~~$9.00~~ $7.00 rheostat $3.00 2.20
totaling $10.00: These first model rheostats should not cost more than $15.00 apiece.

15 good lamps in your office.

Telephone to Mr. Sommers G.E.Co.

Mr. Sommers says that the construction of the headlight lamp nitrogen-filled (type C) has been changed. A single helix is now used instead of the double concentric helix as formerly made — Claims a better beam with the new construction.

Standard lamps made in either 5½ or 6 volt.
normal life 300 hours
Candle power over 140 cp.
watts 98.
Amp Volts 5½ Amps 17.8
Watt per Cd Power 0.7

[55]

July 30, 14.

Test No 12 note 11

Point set against bulb. then glass put on. Blow broke glass but bulb was unimpaired Second blow broke bulb.

Test 14 note 12 point set 1/16 from bulb. Blow broke glass but bulb remained intact.
Filament glowed dimly darkened No apparent leak. new bulb burnt brightly. original bulb replaced burnt brightly also. New glass put on and new trial with first bulb

OR

Test 15 note 13
point 1/8" glass broken half of bulb broken.
Filament caused explosion
safety spring tension good
Mr Monahan & I present to on calibration

Glass of bulb exceptionally thick!

Aug 4, 14

Test 29 Note 14. point set to enter 1/4 inch.
Entrance punched into leading-in wire glass stuck but filament remained intact. Air entered, filament arced to "hot spot" - no explosion.
Failure of safety device.

Test 30 Note 15 point set to enter 1/4 inch
Hole punched through shield into cavity
Bulb destroyed - loose action of safety device

Aug 4, 14

~~test~~ 47 note 6
In this ~~test~~ no new glass was substituted in place of one broken by previous ~~test~~.
Since the glass was not held for a backing the bezel was cracked at the bayonet slot.

Aug 6 1914
~~note~~ amended

~~test~~ 48 note 7
Bezel has been hammered ~~back~~ into shape. Glass taken out of cable elbow.
Better casing cover taken off in these tests
stuck on bezel.

49 note 8. Stuck in cable elbow.

~~test~~ 50 note 7
stuck flat on bezel
glass broken.

CCW

Aug 6.

~~Test~~ 51 Note 10

bulb jarred out of socket but ~~socket~~ was not broken.

Bezel cracked open at bayonet slot.

52 Note 11

bulb jarred out of socket, ?

53 Note 12

filament broke at welded joints.

bezel cracked at slot,

Glass breaks every time we become weary of bezel is poor.

Sept 13

lamp jetted out of rocket.

Aug 6

Model heavy reflector

safety tests in gun + hit at C.

~~Aug~~ 2 Note 14.

set 1/8" shell just pierced

bulb base slightly ~~dented~~ mushed

but still in connecting

Repeat at gun another blow

hole in shell but does not

appear to enter bulb —

bulb turned around and fired

again. 3/16" bulb broken

~~Aug~~ No openings into shell.

[CGS]

Aug 7, 14.

Notes on Model Headpiece.

✓Bayonet pins riveted at inside surface of reflector – sufficient strength without solder.

✓Aluminum reflector bowl. lighter, cost about same, strong. Quality of reflector surface? send to R. P. Burrows?

✓Dropping tests of headpiece – will not the battery ~~caper~~ cover be removed from cable in these tests. Cover rigid enough when in place on battery but not when dropped 6 feet.

✓Finished model of heavy weight resists dropping ~~tests~~ very well. Larger bezel head protects bayonet pins. Very little distortion of bowl. Pins are uninjured.

Flexible metallic tubing as sample.

Aug 7, 14.

Gauges of Metal Parts

Reflector bowl,	.040
Offset shell,	.032
bezel,	.040
Cable elbow	.040
Safety Spring,	.045
Plunger Spring	.013

Advisability to reduce flexible metallic tubing from 4" to 2"?

55 note 14 Aug 7, 14

Bezel straightened ring

~~test~~ 54,

Lamp socket changed to have one long taper.

Test 67.

Austral bulb. Glass cracked,

Complete headpiece dropped from 4th storage Battery Building, landing on concrete sidewalk about 50 ft.

glass broken, bulb broken, filament broken.

Struck on face of bezel opposite elbow.

Reflector unimpaired except one fin cleaned off.

Test 68. dropped 6 ft on concrete floor.
bulb remained in circuit OK
but filament broke.
glass broke

Aug. 11, 14.

Flux lamps

#2	156 hrs	.686 cp
#4	96½	.500 cp.
#6	144	.713 cp.
#8	144½	.537 candle power.
#11	89½	
#13	70½	
#14	97½	
#15	116½	
~~#20~~	~~104½~~	
	163 hrs this	5PM. ~~AM cor 9 PM~~

729 cracked on offset piece but soldered.

No. 16. bend of hook cracked

Aug. 13, 14,

Ten headpieces returned to Bureau.
#7 and #9 had springs retempered.

Ten headpieces Nos. 45, 10, 12, 16, 48
29, 5, 21, 7, 9,

10 glasses for heavy reflectors.
10 " " thin "
10 " " " reflector.
2 box 10 each 20 bulbs.
12 bulbs in lamps.
32 total

Above inspected by Mr. Monahan and I and then sent tonight to H H Clark, Pittsburg Pa.

[715]

Burrows says:

6500 coal mines in U.S.
470,000 miners
59% work 8 hours daily
20% " 10 " "
18% " 9 " "

72% of coal cost is wages
63% of wages goes to miners and helpers.

Burrow lamps list 30% and 58% discount.

Aug 13, 14.

Mr. Annin and Mr. Burrows called this afternoon.

Mr. Burrows showed me three sample reflectors and distribution curves for same. They were brass, aluminum painted.

Mr. Burrows will make tests of my reflector dull nickel finish, then coated with aluminum paint.

Mr. Annin will submit new samples, to be tested first by Burrows.

R S Kerrick called up that he would submit more samples.

1000 Mad life bulbs as ord by Mr Lehmann March 20, 14
Mazda bulb just entered which GS 5/8" dia helical tip. Same as number 2.6 volt

Date ordered G.E. May 12, 14
Date Received 973 June 6, 14
our order No E.S.B. 20242
number received 973 June 6, 14

Aug. 14, 14,

Copy from L C. Illsley
Letter from acting Director of Bureau at Washington advises that G.E. lamps vary in candle power more than permissible.

Letter from R S Carrick, Independent Lamp & Wire Co 1733 Broadway and reply.

Letter to Sales Dept of G E. Harrison advising failure of uniformity of miniature lamps.

Letter to Clark Pittsburg advising return of 10 headpieces for continuance of tests.

Report for week of Aug 13, 14.

Aug 15, 14,

Wrote requirements for safety clearances.
Plotted discharge runs lamps & .060 wire.
Bulb data - only few on test.

Aug 17, 14.

Mr. H. K. Cumin.
Elux Miniature Lamp Division
324 Lafayette Street
New York City
of National Lamp Co. General Electric Co.

Harrison Branch General Electric Co.

Independent Lamp & Wire Co
1733 Broadway
Tel Columbus 4856
Mr R. S. Carruck
Mr. Phillips had been with G E - said he expected non-uniformity of G E bulbs.
538 Gregory Av. Weehawken
Union 1016.

Mc Candless H. W. & Co
Electric Lamps
67 Park Place
Barclay 5950

1st samples received July 17.

Aug 17, 14.

Inter-State Electric Novelty Co
29 Park Place
Tel Barclay 6812

Mr Block.

[est]

Aug 18, 19, 14.

Mr. Edison called me to Library in morning and asked me to try different methods of using safety springs.

Made wooden box for experimental model.

Mounted 2 lamp receptacles upon metal frame set into box.

Cut out two springs.

Made punch and die for bending springs.

Started to bend springs. Many annealings and special care must be taken not to crack spring.

Aug 20, 14.

Worked on double safety spring.

Made three. 2 broke at bends.
last one not drawn enough. One spring broke.

Mr. Edison saw last one just after it broke. Said it would work. Said make it longer.

Turned metal mount around and made long spring

Clarks letter 5 P M.
New address Box 604 Ellsworth Maine.

Aug 21. 14.

Received letter from Cutler-Hammer Mfg. Co advising that all work on headlight reflectors was suspended.

Made two long springs for model. Finished, tempered and mounted.

11:30 went over to battery to get heavy-reflector model. Mr. Edison asleep.

Saw Mr Edison 2 PM. Rather discouraging.

Started a long double spring to fit into model headpiece.

Sat. Aug 22. 1914

Letter from Mr Ilsley received saying that safety tests will be made Tuesday Aug 25.

I replied by letter regretting that I could not be present but would like to be advised of any failures.

Drilled holes in model reflector and worked on spring.

Mon Aug 24, 14.

Finished double spring and made dropping ~~tests~~ and breaking ~~tests~~.

Mr. Edison suggested ~~that~~ I turn out some brass bulbs and cut off at different amounts for purposes of ~~tests~~.

.026 - .027" spring steel.

Letter rec'd from C. M Bunnell
Reply
Letter to Clark for description of ~~tests~~.

C95]

Tues. Aug 25, 14.

.035" spring steel started for long single safety spring.

Finished first long spring but ~~at last minute~~ at 4:30 it broke while trying a large bulb.

Mr Carrick called today with sample bulbs from Independent Lamp and Wire Co

3686 Wed Aug 26, 14.

Looked up two inquiries in regard to cells sent to New River Collieries and to Cuttler Hammer Co.

Cutout template for long single "spring

Received 1 doz G.E. Bulbs and brass bulb model from Mr Monahan.

Made one long single spring. Shape good but I think it is a little to flexible & not quite stiff enough.

Mr Edison called me to the Library again about 5 PM Wants point contact suspension tried.

3686 Thurs. Aug 27, 14.

Wrote report for past week.

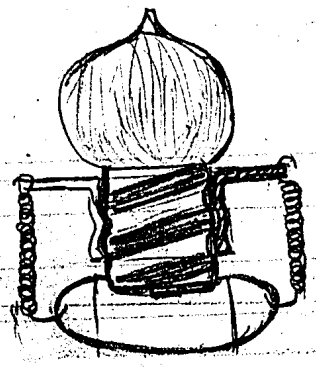
Finished long single spring. Same shape as finished yesterday but shape did not seem quite right. Annealed, and corrected curve. Rehardened and tempered. Made dropping tests — OK. On the fourth safety test bulb broke with a small opening — absolute failure. Obtained by a quick snappy blow.

Set up the double spring and deliberately duplicated the failure

Tried same experiment with Nico lamp with same result. Photographed Nico failure

Showed all three failures to Mr Edison. Spring no good. Suggested to try off center spring arrangement.

CWJ



3686 Fri. Aug 28, 14

Received letter from C. M. Bunnell and replied to same.

Rewrote report for past week at request of Mr. H. 11:45 AM.

Worked all afternoon on ~~bulb~~ spring - (toggle joint) device too sensitive in dropping tests - possible to break bulb without interrupting lamp circuit.

Mr. Edison busy testing records ~~at night~~ so I reserved my interview with him until last Morning.

3496 Sat Aug 29, 14.

Saw Mr. Edison this morning 9:30 AM.
Explained failures of spring toggle
safety suggestion. Not much comment -
said to try out spring contact
suspension scheme.

[101]

3686 Mon. Aug 31, 14,

Made a new spring with slightly depressed spot for bearing of bulb tips. Rehardened and retempered twice before shape was OK.

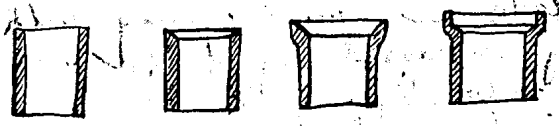
Tested – was able to pierce the bulb but bulb still jumps out.

Showed to Mr Edison – he didn't like the spring – wants flat spring from side to give a direct push downward. Also to reduce weight of brass screw on bulb.

Very difficult to remove brass screw shells without breaking leads.

Cannot boil them out

Tried H_2SO_4 – drilled holes to allow acid to act on larger surface.



3686 Tues Sept 1, 14

Softened plaster of Paris in lamp bulbs and got out eight good bulbs.

Turned off screw shell bases and stuck in glass bulbs with Plaster of Paris. Soldered leads.

Made a flat spring from side. Tried four different shaped socket seats.

On dropping tests, the bulbs jumped out.

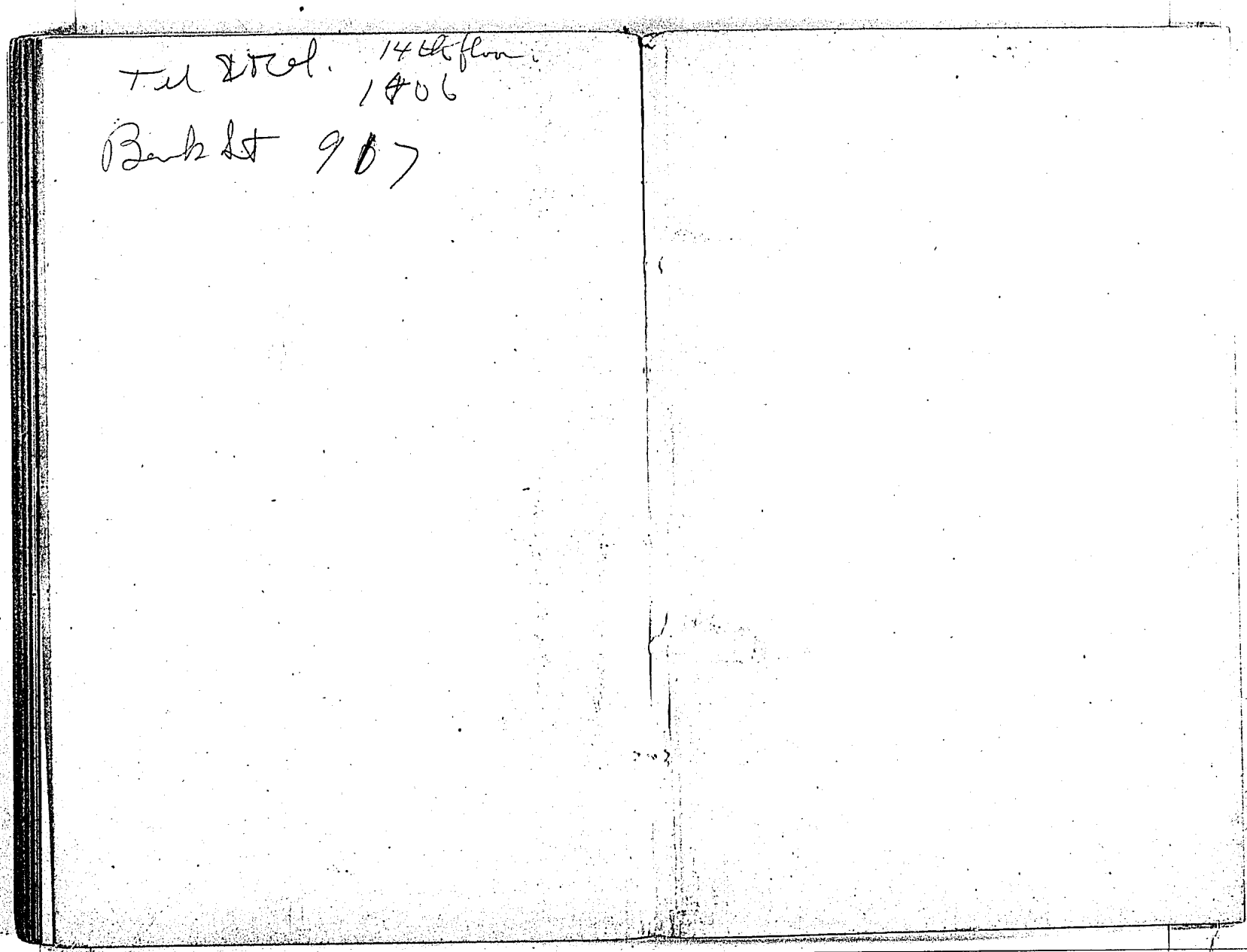
On breaking tests - bulbs are knocked out of position before breaking.

decided to try stiffer spring to hold during dropping tests.

3686

Tues. Sept 2, 14.

3686 Standing Order to cover Mining Lamp Experiments and Charging Boards.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